

What is claimed is:

1. A method of creating a sketch-based eggcrate substructure for manufacturing composite parts, said method comprising:  
creating an input model from a plurality of inputs; and  
launching a batch job of said created input model.
2. A method in accordance with claim 1 wherein said input model is created using inputs including locations that are inexact and incomplete.
3. A method in accordance with claim 1 wherein said input model includes a periphery having at least one of a plurality of sides and intersections.
4. A method in accordance with claim 1 wherein said input model includes lines lying in at least one of a same and different planes.
5. A method in accordance with claim 1 wherein said inputs are stored and retrievable.
6. A method in accordance with claim 1 wherein said batch job is launched from a web page.
7. A method in accordance with claim 1 wherein when said batch job fails, an error message is provided.
8. A method in accordance with claim 7 further comprising re-launching said batch job when said batch job fails.
9. A method in accordance with claim 8 further comprising verifying said inputs to said batch job prior to re-launching said batch job.
10. A method in accordance with claim 1 further comprising obtaining an output model by running said batch job.

11. A method in accordance with claim 10 wherein said output model contains both three-dimensional space and two-dimensional draw geometry.

12. A method in accordance with claim 10 further comprising displaying said output model for review.

13. A method in accordance with claim 12 further comprising receiving verification that said output model is acceptable.

14. A method in accordance with claim 13 further comprising merging an ITS spec sheet into an output model tool drawing.

15. A method in accordance with claim 14 further comprising adding a substructure flag note to a face of said output model tool drawing.

16. A method in accordance with claim 15 further comprising sending said ITS spec sheet to tool fabrication.

17. A method in accordance with claim 16 further comprising:  
preparing a formatted output for NC Programming; and  
sending said formatted output to NC Programming.

18. A method in accordance with claim 12 further comprising changing said inputs when said output model is unacceptable, said changed inputs including three-dimensional sketch and at least one of web and interactive inputs.

19. A method in accordance with claim 18 further comprising repeating said batch job with said changed inputs.

20. A method in accordance with claim 18 wherein a display of said input model is interactively and simultaneously changed upon each changed input entry.

21. A method in accordance with claim 1 wherein said inputs include at least one of CAD and web inputs.

22. A method in accordance with claim 1 wherein said inputs include at least one of Geometry Input Specs, Output Options, Top Curve Inputs, Interlock Slots, AC Notch Inputs, Diagonal Inputs, and Lightening Hole Set Inputs.

23. A method in accordance with claim 22 wherein said Geometry Input Specs group together geometric elements in a three-dimensional CAD sketch that represent a set of supports of a given type, a set of diagonals of a given type, both Stay-Out area Solids and Lightening Hole Stay-out Area Solids, and a set of at least one of surfaces and faces representing the bottom of a tool face sheet.

24. A method in accordance with claim 23 wherein said input model contains said three-dimensional sketch used to generate eggcrate supports.

25. A method in accordance with claim 23 wherein cutout areas made from input solids are always perpendicular to a support.

26. A method in accordance with claim 23 wherein fillets can be made for almost any two-dimensional wireframe profile in a predictable manner, even when part of the profile must be removed.

27. A method in accordance with claim 23 wherein periphery header locations only need to be sketched.

28. A method in accordance with claim 23 wherein internal header locations only need to be sketched.

29. A method in accordance with claim 23 wherein internal intercostals locations only need to be sketched.

30. A method in accordance with claim 23 wherein snap-to diagonal locations only need to be sketched.

31. A method in accordance with claim 23 wherein internal supports are one of trimmed and extended to other supports.

32. A method in accordance with claim 23 wherein solids can be used to represent the placement of any non-eggcrate part in the design and eggcrate features will be generated to accommodate these parts in the design.

33. A method in accordance with claim 23 wherein a support top edge is generated so that it only makes contact with a bottom of said tool face sheet even with highly contoured parts.

34. Apparatus for creating a sketch-based eggcrate substructure for manufacturing composite parts, said apparatus comprising:

means for creating an input model from a plurality of inputs; and

means for launching a batch job of said created input model.

35. Apparatus in accordance with claim 34 wherein said input model is created using inputs including locations that are inexact and incomplete.

36. Apparatus in accordance with claim 34 wherein said input model includes a periphery having at least one of a plurality of sides and intersections.

37. Apparatus in accordance with claim 34 wherein said input model includes lines lying in at least one of a same and different planes.

38. Apparatus in accordance with claim 34 wherein said inputs are stored and retrievable.

39. Apparatus in accordance with claim 34 wherein said batch job is launched from a web page.

40. Apparatus in accordance with claim 39 wherein when said batch job fails, an error message is provided.

41. Apparatus in accordance with claim 40 wherein when said batch job fails, said batch job is re-launched.

42. Apparatus in accordance with claim 40 wherein said inputs to said batch job are verified prior to said re-launching.

43. Apparatus in accordance with claim 34 wherein an output model is obtained by running said batch job.

44. Apparatus in accordance with claim 43 wherein said output model contains both three-dimensional space and two-dimensional draw geometry.

45. Apparatus in accordance with claim 43 wherein said output model is displayed for review.

46. Apparatus in accordance with claim 45 wherein verification is received when said output model is acceptable.

47. Apparatus in accordance with claim 46 wherein when an output model tool drawing is obtained, an ITS spec sheet is merged into said output model tool drawing.

48. Apparatus in accordance with claim 47 wherein a substructure flagnote is added to a face of said output model tool drawing.

49. Apparatus in accordance with claim 48 wherein said ITS spec sheet is sent to tool fabrication.

50. Apparatus in accordance with claim 49 wherein a formatted output is prepared and sent to NC Programming.

51. Apparatus in accordance with claim 45 wherein when said output model is unacceptable, said inputs are changed, including three-dimensional sketch and at least one of web and interactive inputs.

52. Apparatus in accordance with claim 51 wherein said batch job is repeated with said changed inputs.

53. Apparatus in accordance with claim 52 wherein said changed inputs include a change in “type” of thickness.

54. Apparatus in accordance with claim 51 wherein a display of said input model is interactively and simultaneously changed upon each changed input entry.

55. Apparatus in accordance with claim 34 wherein said inputs include at least one of CAD and web inputs.

56. Apparatus in accordance with claim 34 wherein said inputs include at least one of Geometry Input Specs, Output Options, Top Curve Inputs, Interlock Slots, AC Notch Inputs, Diagonal Inputs, and Lightening Hole Set Inputs.

57. Apparatus in accordance with claim 56 wherein said Geometry Input Specs group together geometric elements in a three-dimensional CAD sketch that represent a set of supports of a given type, a set of diagonals of a given type, both Stay-Out area Solids and Lightening Hole Stay-out Area Solids, and a set of at least one of surfaces and faces representing a bottom of a tool face sheet.

58. Apparatus in accordance with claim 57 wherein said input model contains only said three-dimensional sketch used to generate eggcrate supports.

59. Apparatus in accordance with claim 57 wherein cutout areas made from input solids are always perpendicular to a support.

60. Apparatus in accordance with claim 57 wherein fillets can be made for almost any two-dimensional wireframe profile in a predictable manner, even when part of the profile must be removed.

61. Apparatus in accordance with claim 57 wherein periphery header locations only need to be sketched.

62. Apparatus in accordance with claim 57 wherein internal header locations only need to be sketched.

63. Apparatus in accordance with claim 57 wherein internal intercostals locations only need to be sketched.

64. Apparatus in accordance with claim 57 wherein snap-to diagonal locations only need to be sketched.

65. Apparatus in accordance with claim 57 wherein internal supports are one of trimmed and extended to other supports.

66. Apparatus in accordance with claim 57 wherein solids can be used to represent the placement of any non-eggcrate part in the design and eggcrate features will be generated to accommodate these parts in the design.

67. Apparatus in accordance with claim 57 wherein a support top edge is generated so that it only makes contact with a bottom of said tool face sheet even with highly contoured parts.